

its X-ray tube and its X-ray detector; and said positional relation detecting means obtains the information regarding the positional relations of the X-ray imaging systems in accordance with said change in the external shape of said X-ray imaging system.

Claim 4 (Previously Presented): A radiographic X-ray device of claim 1, further comprising:
a top plate for carrying a subject being inspected, said top plate configured to move in reference to the common coordinate system of the X-ray imaging systems having the mechanical center of the device as the reference point,

wherein said shape data registering means further registers shapes of three dimensional models corresponding to the top plate's external shape; and said positional relation detecting means obtains the information regarding positional relations between the X-ray imaging systems and the top plate based on their current positions and the external shape data of the three dimensional model so that the imaging system transport control means can control the X-ray imaging system transport mechanism in accordance with the information regarding the positional relation between the top plate and the X-ray imaging systems.

Claim 5 (Previously Presented): A radiographic X-ray device of claim 1, wherein said positional relation detecting means obtains the information regarding the positional relations of the X-ray imaging systems using an algorithm that judges whether there is any physical contact between the X-ray imaging systems.

Claim 6 (Previously Presented): A radiographic X-ray device of claim 1, wherein said positional relation detecting means obtains the information regarding the positional relations of the X-ray imaging systems using an algorithm that calculates the minimum distance between the X-ray imaging systems.

Claim 7 (Original): A radiographic X-ray device of claim 2, wherein at least one of said X-ray imaging systems can change the arrangement of its X-ray tube and its X-ray detector on the supporting arm for fine tuning a mode of imaging process and to accompany a change in the external shape of said X-ray imaging system in accordance with said change in the arrangement of its X-ray tube and its X-ray detector; and said positional relation detecting means obtains the

information regarding the positional relations of the X-ray imaging systems in accordance with said change in the external shape of said X-ray imaging system.

Claim 8 (Previously Presented): A radiographic X-ray device of claim 2, further comprising:
a top plate for carrying a subject being inspected, said top plate configured to move in reference to the common coordinate system of the X-ray imaging systems having the mechanical center of the device as the reference point,

wherein said shape data registering means further registers shapes of three dimensional models corresponding to the top plate's external shape; and said positional relation detecting means obtains the information regarding positional relations between the X-ray imaging systems and the top plate based on their current positions and the external shape data of the three dimensional model so that the imaging system transport control means can control the X-ray imaging system transport mechanism in accordance with the information regarding the positional relation between the top plate and the X-ray imaging systems.

Claim 9 (Previously Presented): A radiographic X-ray device of claim 3, further comprising:
a top plate for carrying a subject being inspected, said top plate configured to move in reference to the common coordinate system of the X-ray imaging systems having the mechanical center of the device as the reference point,

wherein said shape data registering means further registers shapes of three dimensional models corresponding to the top plate's external shape; and said positional relation detecting means obtains the information regarding positional relations between the X-ray imaging systems and the top plate based on their current positions and the external shape data of the three dimensional model so that the imaging system transport control means can control the X-ray imaging system transport mechanism in accordance with the information regarding the positional relation between the top plate and the X-ray imaging systems.

Claim 10 (Previously Presented): A radiographic X-ray device of claim 2, wherein said positional relation detecting means obtains the information regarding the positional relations of the

X-ray imaging systems using an algorithm that judges whether there is any physical contact between the X-ray imaging systems.

Claim 11 (Previously Presented): A radiographic X-ray device of claim 3, wherein said positional relation detecting means obtains the information regarding the positional relations of the X-ray imaging systems using an algorithm that judges whether there is any physical contact between the X-ray imaging systems.

Claim 12 (Previously Presented): A radiographic X-ray device of claim 4, wherein said positional relation detecting means obtains the information regarding the positional relations of the X-ray imaging systems using an algorithm that judges whether there is any physical contact between the X-ray imaging systems.

Claim 13 (Previously Presented): A radiographic X-ray device of claim 2, wherein said positional relation detecting means obtains the information regarding the positional relations of the X-ray imaging systems using an algorithm that calculates the minimum distance between the X-ray imaging systems.

Claim 14 (Previously Presented): A radiographic X-ray device of claim 3, wherein said positional relation detecting means obtains the information regarding the positional relations of the X-ray imaging systems using an algorithm that calculates the minimum distance between the X-ray imaging systems.

Claim 15 (Previously Presented): A radiographic X-ray device of claim 4, wherein said positional relation detecting means obtains the information regarding the positional relations of the X-ray imaging systems using an algorithm that calculates the minimum distance between the X-ray imaging systems.

Claim 16 (Previously Presented): A radiographic X-ray device of claim 1, wherein said positional relation detecting means obtains the information regarding the positional relations of the X-ray imaging systems using an algorithm that calculates the minimum distance between the X-ray imaging systems.

Claim 17 (Currently Amended): A radiographic X-ray device comprising:

an X-ray imaging system comprising an X-ray tube for radiating X-rays and an X-ray detector for detecting transmitted X-rays, which are arranged to face each other and are mounted on each end of a support arm;

an X-ray imaging system transport mechanism for transporting the X-ray imaging system using a coordinate system having a mechanical center of the device as a reference point;

a shape data registering means of the X-ray imaging system for pre-registering ~~registering~~ three dimensional external shapes corresponding to three dimensional external shapes of the X-ray imaging system, wherein the models are in a voxel data tree format;

a positional relation detecting means for obtaining in real time information regarding positional relations of the X-ray imaging system based on a current position of the X-ray imaging system and the external shape data of the three dimensional model; and

an imaging system transport control means for controlling the X-ray imaging system transport mechanism in accordance with the information regarding the positional relations of the X-ray imaging system detected by the positional relation detecting means.

Claim 18 (Previously Presented): A radiographic X-ray device of claim 17, further comprising:

a top plate for carrying a subject being inspected, said top plate configured to move in reference to a common coordinate system of the X-ray imaging system having the mechanical center of the device as the reference point,

wherein said shape data registering means further registers shapes of three dimensional models corresponding to the top plate's external shape; and said positional relation detecting means obtains the information regarding positional relations between the X-ray imaging systems and the top plate based on their current positions and the external shape data of the three dimensional model so that the imaging system transport control means can control the X-ray imaging system transport mechanism in accordance with the information regarding the positional relation between the top plate and the X-ray imaging system.

Claim 19 (Currently Amended): A radiographic X-ray device comprising:

an X-ray imaging system comprising an X-ray tube for radiating X-rays and an X-ray detector for detecting transmitted X-rays, which are arranged to face each other and are mounted on each end of a support arm;

an X-ray imaging system transport mechanism for transporting the X-ray imaging system using a coordinate system having a mechanical center of the device as a reference point;

a shape data registering means of the X-ray imaging system for pre-registering ~~registering~~ three dimensional external shapes corresponding to three dimensional external shapes of the X-ray imaging system, wherein the models are in a voxel data tree format;

a positional relation detecting means for obtaining in real time information regarding positional relations of the X-ray imaging system based on a current position of the X-ray imaging system and the external shape data of the three dimensional model;

an imaging system transport control means for controlling the X-ray imaging system transport mechanism in accordance with the information regarding the positional relations of the X-ray imaging system detected by the positional relation detecting means; and

a top plate for carrying a subject being inspected, said top plate configured to move in reference to a common coordinate system of the X-ray imaging system having the mechanical center of the device as the reference point,

wherein said shape data registering means further registers shapes of three dimensional models corresponding to the top plate's external shape; and said positional relation detecting means obtains the information regarding positional relations between the X-ray imaging system and the top plate based on their current positions and the external shape data of the three dimensional model so that the imaging system transport control means can control the X-ray imaging system transport mechanism in accordance with the information regarding the positional relation between the top plate and the X-ray imaging system.

Claim 20 (New): A radiographic X-ray device comprising:

a plurality of X-ray imaging systems each comprising an X-ray tube for radiating X-rays and an X-ray detector for detecting transmitted X-rays, which are arranged to face each other and are mounted on each end of a support arm;

an X-ray imaging system transport mechanism for transporting the X-ray imaging systems using a common coordinate system having a mechanical center of the device as a reference point;

a shape data registering means for each X-ray imaging system for advance registration of external shape data of three dimensional models corresponding to three dimensional shapes of the X-ray imaging systems, wherein the shape data is obtained in Standard Triangle Language format, converted into voxel format data, and then converted into Binary Separated Partition data;

a positional relation detecting means for obtaining in real time information regarding positional relations of the X-ray imaging systems based on a current position of each X-ray imaging system and the external shape data of the three dimensional model; and

an imaging system transport control means for controlling the X-ray imaging system transport mechanism in accordance with the information regarding the positional relations of the X-ray imaging systems detected by the positional relation detecting means.